

# HATCHERY AND GENETIC MANAGEMENT PLAN (HGMP)

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|-----------------------------------|---|
| <b>Hatchery Program:</b>          | Minter Creek Chum Program                         |
| <b>Species or Hatchery Stock:</b> | Chum ( <i>Onchorynchus keta</i> )<br>Minter Creek |
| <b>Agency/Operator:</b>           | Washington Department of Fish and Wildlife        |
| <b>Watershed and Region:</b>      | Minter Creek<br>Puget Sound                       |
| <b>Date Submitted:</b>            | , 2004  |
| <b>Date Last Updated:</b>         | April 28, 2004                                    |

## **SECTION 1. GENERAL PROGRAM DESCRIPTION**

### **1.1) Name of hatchery or program.**

Minter Creek Chum Program

### **1.2) Species and population (or stock) under propagation, and ESA status.**

Minter Creek Chum (*Onchorynchus keta*) - not listed

### **1.3) Responsible organization and individuals**

|                          |   |
|--------------------------|---|
| <b>Name (and title):</b> | Ron Warren, Region 6 Fish Program Manager<br>Denis Popochock, Complex Manager |
| <b>Agency or Tribe:</b>  | Washington Department of Fish and Wildlife                                    |
| <b>Address:</b>          | 600 Capitol Way North, Olympia, Wa. 98501-1091                                |
| <b>Telephone:</b>        | (360) 204-1204 (253) 857-6079   |
| <b>Fax:</b>              | (360) 664-0689 (253) 857-6103   |
| <b>Email:</b>            | warrerrw@dfw.wa.gov popocdap@dfw.wa.gov                                       |

#### **Other agencies, Tribes, co-operators, or organizations involved, including contractors, and extent of involvement in the program:**

Approximately 2.2 million eggs go to educational projects, volunteer co-ops and Regional Fisheries Enhancement Group's (RFEG's).

The Purse Seine Vessel Owners Association (PSVOA) entered into an cooperative agreement (from the "Date of Execution" to June 30, 2004) with WDFW (WDFW # 03-1196) to spawn, incubate, rear and release 2.0 million chum from the Minter Creek Hatchery. PSVOA will provide six volunteers to assist in the spawning operations at Minter Creek Hatchery. Three volunteer workers for two days will be provided to remove egg mortality and weigh down remaining population for hatching. Also, PSVOA will provide up to 160 hours of volunteer time for ponding, feeding, cleaning rearing vessels and releasing of the two million chum salmon fry.

### **1.4) Funding source, staffing level, and annual hatchery program operational costs.**

The contract for the 2.0 million release is funded by the PSVOA (\$7,873) and the Puyallup Tribe (50-50 split). Staffing is the crew at Minter Creek and over 160 hours of volunteer time. For the co-op projects, funding is General Fund State.

### **1.5) Location(s) of hatchery and associated facilities.**

## **Broodstock Collection, Incubation, Rearing and Release**

Minter Creek Hatchery: Located on Minter Creek (15.0048) at RM 0.5. Minter Creek is a tributary to Carr Inlet in Puget Sound.

### **1.6) Type of program.**

Integrated harvest

### **1.7) Purpose (Goal) of program.**

Harvest augmentation

The goal of this program is to provide additional salmon harvest opportunities for commercial, tribal and recreational fishers.

### **1.8) Justification for the program.**

This program will be operated to provide fish for harvest while minimizing adverse effects on listed fish. This will be accomplished in the following manner:

1. Release fingerling smolts with no freshwater residence.
2. Release fish just prior to the release of the listed yearling spring chinook. May benefit the chinook by providing a food source in the estuary.
3. Hatchery fish will be propagated using appropriate fish culture methods and consistent with Co-Managers Fish Health Policy and state and federal water quality standards.
4. All fingerling chum released will be acclimated at the hatchery facility capable of trapping the returning adults.

### **1.9) List of program "Performance Standards".**

### **1.10) List of program "Performance Indicators", designated by "benefits" and "risks."**

Performance Standards and Indicators for Puget Sound **Integrated Harvest** chum programs.

| Performance Standard           | Performance Indicator           | Monitoring and Evaluation Plan      |
|--------------------------------|---------------------------------|-------------------------------------|
| Produce adult fish for harvest | Survival and contribution rates | Monitor catch data and rack returns |

|   |  |  |
|---|--|--|
| Meet hatchery production goals  | Number of juvenile fish released - <b>2,000,000</b>  | Estimating number of fish planted (weighing / counting fish), monitoring proximity to hatchery production goals, number released recorded on hatchery divisions "plant reports", data available on WDFW data base. Future Brood Documents. |
| Manage for adequate escapement  | Hatchery return rates<br>Catch rates                 | Monitoring hatchery/wild return rates through trapping (at the hatchery or at weir) and redd and snorkel surveys on the spawning grounds plus catch records.   |
| Minimize interactions with listed fish through proper broodstock management | Total number of broodstock collected - <b>4,500</b>  | Measuring number of fish actually spawned and killed to meet egg take goal at the hatchery. Hatchery Records.  |
|   | Sex ratios   | Hatchery Records, Spawning Guidelines  |
|   | Timing of adult collection                           | Start trapping prior to historical start of the run, continue trapping throughout the run, dates and times are recorded on hatchery divisions "adult reports", data available on WDFW data base.   |
|   | Number of listed fish passed upstream                |  |
|   | Hatchery stray rate                                  |  |
|   | Number wild fish used in broodstock - <b>Unknown</b> | Hatchery records   |
|   | Return timing of hatchery / wild adults              | Hatchery records<br>Hatchery records   |

#### Spawning Guidelines

|   |   |   |
|---|---|---|
|   | Adherence to spawning guidelines  |   |
| Minimize interactions with listed fish through proper rearing and release strategies  | Juveniles released as smolts  | Future Brood document and Hatchery records                    |
|   | Outmigration timing of listed fish / hatchery fish - <b>April-May / April</b>   | Hatchery records and historical natural out-migrant data      |
|   | Size and time of release - <b>450 fpp/ April</b>  | FBD and Hatchery records                                      |
|   | Hatchery stray rates  |   |
| Maintain stock integrity and genetic diversity  | Effective population size   | Spawning Guidelines   |
|   | HOR spawners  | Spawning ground surveys                                       |
| Maximize in-hatchery survival of broodstock and their progeny; and<br><br>Limit the impact of pathogens associated with hatchery stocks, on listed fish | Fish pathologists will monitor the health of hatchery stocks on a monthly basis and recommend preventative actions / strategies to maintain fish health | Co-managers Disease Policy and Fish Health monitoring records |
|   | Fish pathologists will diagnose fish health problems and minimize their impact  |   |
|   | Vaccines will be administered when appropriate to protect fish health   |   |

|  |  |                       |
|--|--|-----------------------|
|  | A fish health database will be maintained to identify trends in fish health and disease and implement fish health management plans based on findings |                       |
|  | Fish health staff will present workshops on fish health issues to provide continuing education to hatchery staff.                                    |                       |
| Ensure hatchery operations comply with state and federal water quality standards through proper environmental monitoring | NPDES compliance   | Monthly NPDES records |

**1.11) Expected size of program.**

**1.11.1) Proposed annual broodstock collection level (maximum number of adult fish).**

4,500 adults.

**1.11.2) Proposed annual fish release levels (maximum number) by life stage and location.**

| Life Stage | Release Location       | Annual Release Level |
|------------|------------------------|----------------------|
| Eyed Eggs  |                        |                      |
| Unfed Fry  |                        |                      |
| Fry        | Minter Creek (15.0048) | 2,000,000            |
| Fingerling |                        |                      |
| Yearling   |                        |                      |

**1.12) Current program performance, including estimated smolt-to-adult survival rates, adult production levels, and escapement levels. Indicate the source of these data.**

Escapement levels back to the hatchery from 1995 through 2002 have been 39,883, 28,505, 9,746, 44,658, 18,425, 24,973, 23,218 and 52,201, respectively.

**1.13) Date program started (years in operation), or is expected to start.**

Pre-1970.

**1.14) Expected duration of program.**

Ongoing

**1.15) Watersheds targeted by program.**

Minter Creek (15.0048)

**1.16) Indicate alternative actions considered for attaining program goals, and reasons why those actions are not being proposed.**

No alternative actions considered at this time.

**SECTION 2. PROGRAM EFFECTS ON ESA-LISTED SALMONID POPULATIONS.**

**2.1) List all ESA permits or authorizations in hand for the hatchery program.**

None.

**2.2) Provide descriptions, status, and projected take actions and levels for ESA-listed natural populations in the target area.**

**2.2.1) Description of ESA-listed salmonid population(s) affected by the program.**

- Identify the ESA-listed population(s) that will be directly affected by the program.

- Identify the ESA-listed population(s) that may be incidentally affected by the program.

**Puget Sound Chinook:**

**South Sound Tributary Summer/Fall Chinook.** Stock-specific spawning ground, juvenile life history, survival and productivity data are generally lacking for this natural population. The population is presumed to be similar in biological characteristics to the other south Puget Sound fall chinook populations (Puyallup River and Green River fall chinook), since it is thought to be dependent on ongoing hatchery production (strays) in south Puget Sound. SASSI defines this stock as naturally spawning chinook in a number of widely distributed rivers, including McAllister Creek, Grovers Creek, Gorst Creek, Chambers Creek, Carr Inlet tributaries, the Deschutes River and other small streams in south Puget Sound.

**White River Spring Chinook.** There is a hatchery supplementation program for this stock at the Hupp Springs rearing facility in the Minter Creek watershed. This program is

independent of the White River natural population, utilizing on-station returns to the Minter Creek trap for broodstock and releasing 90,000 yearlings and 250,000 fingerlings into Minter Creek each year. Excess production is transferred to the White River.

**2.2.2) Status of ESA-listed salmonid population(s) affected by the program.**

**- Describe the status of the listed natural population(s) relative to “critical” and “viable” population thresholds.**

Preliminary critical and viable population thresholds for White River chinook under ESA have been determined by the Technical Review Team (Co-managers TRT) at 200 and 1,000, respectively. The White River spring chinook population has been determined to be "critical" and South Sound Tributary summer/fall chinook are not rated under SaSI (draft 2002).

**- Provide the most recent 12 year (e.g. 1988-present) progeny-to-parent ratios, survival data by life-stage, or other measures of productivity for the listed population. Indicate the source of these data.**

Not known

**- Provide the most recent 12 year (e.g. 1988-1999) annual spawning abundance estimates, or any other abundance information. Indicate the source of these data.**

***White River Spring Chinook Average Annual Returns, 1992 to 1999:*** 462 (range 316-604)

Estimates of fall chinook spawning naturally in South Sound Tributaries:

| <u>Year</u> | <u>Spawning numbers</u> |
|-------------|-------------------------|
| 1988        | 4257                    |
| 1989        | 4979                    |
| 1990        | 15814                   |
| 1991        | 3681                    |
| 1992        | 3610                    |
| 1993        | 2998                    |
| 1994        | 4950                    |
| 1995        | 7456                    |
| 1996        | 14931                   |
| 1997        | 4192                    |
| 1998        | 6372                    |
| 1999        | 11028                   |

**- Provide the most recent 12 year (e.g. 1988-1999) estimates of annual proportions of direct hatchery-origin and listed natural-origin fish on natural spawning grounds, if known.**



South Sound Tributary Summer/Fall Chinook- Unknown. We do not have spawning ground data to estimate the proportion of origin of the spawners in South Sound independent tributaries.

White River Spring Chinook-Unknown. These escapements are likely predominantly hatchery-origin fall chinook because of low escapements passed above the rack and expected low natural chinook productivity in this watershed.

**2.2.3) Describe hatchery activities, including associated monitoring and evaluation and research programs, that may lead to the take of listed fish in the target area, and provide estimated annual levels of take.**

**- Describe hatchery activities that may lead to the take of listed salmonid populations in the target area, including how, where, and when the takes may occur, the risk potential for their occurrence, and the likely effects of the take.**

Broodstock collection of chum does not coincide or overlap with the return of listed spring chinook adults. Thus, no "take" would be associated with chum broodstock collection.

The Species Interaction Workgroup (SIWG) (1984) identified chum as posing a low risk of competition and predation to naturally produced chinook in freshwater.

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Minter Creek hatchery chum likely have little interaction with listed stocks, but may contribute as forage fish to yearling and older chinook (including Hupp Springs White River yearling chinook production), coho, cutthroat and steelhead. They may compete with local natural chum and pink production in the estuarine and marine areas.

**- Provide information regarding past takes associated with the hatchery program, (if known) including numbers taken, and observed injury or mortality levels for listed fish.**

NA

**- Provide projected annual take levels for listed fish by life stage (juvenile and adult) quantified (to the extent feasible) by the type of take resulting from the hatchery program (e.g. capture, handling, tagging, injury, or lethal take).**

See "take" table at the end of the HGMP.

**- Indicate contingency plans for addressing situations where take levels within a given year have exceeded, or are projected to exceed, take levels described in this plan for the program.**

NOAA Fisheries will be notified prior to exceeding the take in any specific category of

the White River spring chinook program.

### **SECTION 3. RELATIONSHIP OF PROGRAM TO OTHER MANAGEMENT OBJECTIVES**

**3.1) Describe alignment of the hatchery program with any ESU-wide hatchery plan (e.g. Hood Canal Summer Chum Conservation Initiative) or other regionally accepted policies (e.g. the NPPC Annual Production Review Report and Recommendations - NPPC document 99-15). Explain any proposed deviations from the plan or policies.**

The Minter Creek Hatchery chum salmon program HGMP is included as one of 51 WDFW-managed plans under the co-managers' non-chinook Resource Management Plan (RMP) for Puget Sound region non-chinook salmon hatcheries. This HGMP is in alignment with the RMP, which serves as the overarching comprehensive plan for state and tribal non-chinook salmon hatchery operations in the region.

As affirmed in the co-managers' RMP, WDFW hatchery programs in Puget Sound must adhere to a number of guidelines, policies and permit requirements. These constraints are designed to limit adverse effects on cultured fish, wild fish and the environment that might result from hatchery practices. Following is a list of guidelines, policies and permit requirements that govern WDFW hatchery operations:

*Genetic Manual and Guidelines for Pacific Salmon Hatcheries in Washington.* These guidelines define practices that promote maintenance of genetic variability in propagated salmon (Hershberger and Iwamoto 1981).

*Spawning Guidelines for Washington Department of Fisheries Hatcheries.* Assembled to complement the above genetics manual, these guidelines define spawning criteria to be used to maintain genetic variability within the hatchery populations (Seidel 1983).

*Stock Transfer Guidelines.* This document provides guidance in determining allowable stocks for release from each hatchery. It is designed to foster development of locally-adapted broodstock and to minimize changes in stock characteristics brought on by transfer of non-local salmonids (WDF 1991).

*Salmonid Disease Control Policy of the Fisheries Co-Managers of Washington State.* This policy designates and delineates Fish Health Management Zones and defines inter and intra-zone transfer policies and guidelines for eggs and fish. These are designed to limiting the spread of fish pathogens between and within watersheds. (WDFW, NWIFC, 1998).

*National Pollutant Discharge Elimination System Permit Requirements.* This permit sets forth allowable discharge criteria for hatchery effluent and defines acceptable practices for hatchery operations to ensure that the quality of receiving waters and ecosystems associated with those waters are not impaired.

**3.2) List all existing cooperative agreements, memoranda of understanding, memoranda of agreement, or other management plans or court orders under which program operates.**

This hatchery, as well as other WDFW hatcheries, operates under *U.S. v Washington* that provides the legal framework for coordinating these programs, defining artificial production objectives, and maintaining treaty fishing rights through the court-ordered Puget Sound Salmon Management Plan (1985). This co-management process requires that both the State of Washington and the relevant Puget Sound Tribe(s) develop program goals and objectives and agree on the function, purpose and release strategies of all hatchery programs. The Future Brood Document is a detailed listing of annual production goals. This is reviewed and updated each spring and finalized in July. The Current Brood Document reflects actual production relative to the annual production goals. This second document is developed in the spring after eggs spawned that year have been enumerated and actual resultant juvenile fish production levels can be estimated. Through this process, the co-managers document their agreement on the function, purpose and release strategies for all Puget Sound region hatchery programs.

**3.3) Relationship to harvest objectives.**

**3.3.1) Describe fisheries benefitting from the program, and indicate harvest levels and rates for program-origin fish for the last twelve years (1988-99), if available.**

Harvest rates are not available for this production and contribution to specific fisheries are not discernable from existing data. However, estimates of catches of Minter Creek hatchery chum salmon by Puget Sound harvest area (including both treaty and non-treaty catches) are available:

| Year | Escape<br>Minter<br>Creek | Strait<br>(4B-6A) | San Juans<br>(7-7A) | Mid-Sound<br>(6B-11) | South Sound<br>(13-13A) |
|------|---------------------------|-------------------|---------------------|----------------------|-------------------------|
| 1988 | 425                       | 623               | 182                 | 10,653               | 6,623                   |
| 1989 | 1,883                     | 553               | 253                 | 7,045                | 3,379                   |
| 1990 | 421                       | 74                | 43                  | 1,126                | 849                     |
| 1991 | 9,569                     | 1,442             | 798                 | 24,419               | 6,461                   |
| 1992 | 5,014                     | 398               | 168                 | 10,016               | 1,758                   |
| 1993 | 14,200                    | 654               | 368                 | 27,342               | 10,223                  |
| 1994 | 23,355                    | 716               | 205                 | 16,051               | 479                     |
| 1995 | 26,264                    | 509               | 306                 | 13,259               | 364                     |
| 1996 | 17,902                    | 413               | 0                   | 9,563                | 5                       |
| 1997 | 6,191                     | 253               | 0                   | 1,135                | 15                      |
| 1998 | 28,337                    | 328               | 188                 | 18,687               | 96                      |
| 1999 | 8,087                     | 93                | 0                   | 3,508                | 0                       |

**3.4) Relationship to habitat protection and recovery strategies.**

Not applicable - there are no listed natural populations in the program target area.

### 3.5) Ecological interactions.

\_\_\_\_\_ *(1) Salmonid and non-salmonid fishes or other species that could negatively impact the program.*

Negative impacts by fishes and other species on the Minter Creek Hatchery chum program could occur directly through predation on program fish, or indirectly through food resource competition, genetic effects, or other ecological interactions. In particular, fishes and other species could negatively impact Minter Creek chum survival rates through predation on newly released, emigrating juvenile fish in the freshwater and marine areas. Certain avian and mammalian species may also prey on juvenile chum while the fish are rearing at the hatchery site, if these species are not excluded from the rearing areas. Species that could negatively impact juvenile chum through predation include the following:

- Avian predators, including mergansers, cormorants, belted kingfishers, great blue herons, and night herons
- Mammalian predators, including mink, river otters, harbor seals, and sea lions

Rearing and migrating adult chum originating through the program may also serve as prey for large, mammalian predators in marine areas, nearshore marine areas and in the Minter Creek estuary to the detriment of population abundance and the program's success in augmenting harvest. Species that may negatively impact program fish through predation may include:

- Orcas
- Sea lions
- Harbor seals
- River otters

\_\_\_\_\_ *(2) Salmonid and non-salmonid fishes or other species that could be negatively impacted by the program (focus is on listed and candidate salmonid species).*

\_\_\_\_\_ - chum and pink salmon

*3) Salmonid and non-salmonid fishes or other species that could positively impact the program*

Fish species that could positively impact the program may include coho salmon and other salmonid species present in the Minter Creek watershed through natural and hatchery production. Decaying carcasses of spawned adult fish may contribute nutrients that increase productivity in the watershed, providing food resources for the emigrating chum.

*4) Salmonid and non-salmonid fishes or other species that could be positively impacted by the program.*

Freshwater and marine fish species that prey on juvenile fish could be positively impacted by the chum program. Nutrients provided by decaying hatchery chum carcasses may also benefit fish in freshwater. These species include:

- Northern pikeminnow
- Chinook
- Steelhead
- Pacific staghorn sculpin
- Numerous marine pelagic fish species

## **SECTION 4. WATER SOURCE**

**4.1) Provide a quantitative and narrative description of the water source (spring, well, surface), water quality profile, and natural limitations to production attributable to the water source.**

The water source use for fish rearing at Minter Creek Hatchery is surface water from Minter Creek. Water quality varies greatly with the time of the year and weather. Temperature profiles are monitored. Water quality is improved by the settling of solids from incoming water in the rearing ponds. There is no data on differences in water temperature between the water source and the discharging water of the ponds.

**4.2) Indicate risk aversion measures that will be applied to minimize the likelihood for the take of listed natural fish as a result of hatchery water withdrawal, screening, or effluent discharge.**

There are no native, listed fish in Minter Creek and chinook are not passed upstream at Minter Creek. At Minter Creek Hatchery, there are two intake structures that presently do not conform to NOAA Fisheries guidelines. They are scheduled to be replaced in the near future. The hatchery operates under NPDES permit number WAG 13-1024. During the summer it is not always possible to meet the goals for settleable solids from the pollution abatement pond due to the prolific growth of algae in the abatement pond.

The water right permit # for the facility is S2-21357.

## **SECTION 5. FACILITIES**

**5.1) Broodstock collection facilities (or methods).**

Broodstock returning to Minter Creek from November to December use a concrete step ladder ending in a sorter from which species are separated into any one of 4 holding ponds or returned upstream or back downstream in some cases. All salmon are trapped during that time. All non-target species are released upstream as soon as practical.

**5.2) Fish transportation equipment (description of pen, tank truck, or container used).**

Fish are typically hauled in a 300 gallon steel tank. If a larger tank is needed it is borrowed from another facility.

**5.3) Broodstock holding and spawning facilities.**

At Minter Creek Hatchery, broodstock are held until ripe in concrete raceway-style ponds measuring 20' X 120'.

**5.4) Incubation facilities.**

All incubation is done in vertical-style incubators using either pathogen free well water or Minter Creek water.

**5.5) Rearing facilities.**

Fish are reared in any one of several different sized concrete raceway ponds, either 10' X 100' or more commonly in 20' X 140'.

**5.6) Acclimation/release facilities.**

Fish are acclimated on Minter Creek surface water for release into Minter Creek.

**5.7) Describe operational difficulties or disasters that led to significant fish mortality.**

In the fall of 2000, over 18,300 adult chums were placed upstream to spawn. Due, in part, to low wintertime flows, the heavy nutrient loading caused severe screen plugging from fungal mats and bacterial gill disease in fish reared on creek water.

**5.8) Indicate available back-up systems, and risk aversion measures that will be applied, that minimize the likelihood for the take of listed natural fish that may result from equipment failure, water loss, flooding, disease transmission, or other events that could lead to injury or mortality.**

The hatchery is staffed full time and have modern water alarm systems which are tested weekly.

**SECTION 6. BROODSTOCK ORIGIN AND IDENTITY**

**Describe the origin and identity of broodstock used in the program, its ESA-listing status, annual collection goals, and relationship to wild fish of the same species/population.**

**6.1) Source.**

Broodstock source is adult chum returning to the Minter Creek Hatchery.

**6.2) Supporting information.**

**6.2.1) History.**

Minter creek chum were derived from Hood Canal stock in the 1970's. Starting in the late 1980's all Minter Creek Hatchery (Hood Canal origin) chum were eliminated and the stock was replaced with Elson Creek stock which is a local South Puget Sound stock.

**6.2.2) Annual size.**

4,500 adults

**6.2.3) Past and proposed level of natural fish in broodstock.**

Minter Creek Chum came from the Squaxin Tribe Elson Creek Hatchery. The Elson Hatchery stock was founded on local wild chums. At Minter Creek, surplus chum are passed upstream to spawn naturally and may contribute adult returns to the hatchery trap. They cannot be distinguished from hatchery reared chum returns so they may be spawned.

**6.2.4) Genetic or ecological differences.**

None known

**6.2.5) Reasons for choosing.**

Locally adapted stock..

**6.3) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish that may occur as a result of broodstock selection practices.**

NA

**SECTION 7. BROODSTOCK COLLECTION**

**7.1) Life-history stage to be collected (adults, eggs, or juveniles).**

Adults.

**7.2) Collection or sampling design.**

Chum return to Minter Creek from November to December. They are trapped by use of an instream barrier dam and a step ladder. At Minter, the fish enter a sorter prior to entering the holding ponds.

### 7.3) Identity.

All fish entering the holding area during the months of November and December.

### 7.4) Proposed number to be collected:

#### 7.4.1) Program goal (assuming 1:1 sex ratio for adults):

4,500 (2,250 males:2,250 females)

#### 7.4.2) Broodstock collection levels for the last twelve years (e.g. 1988-99), or for most recent years available:

| Year | Adults  |       |       | Eggs      | Juveniles |
|------|---------|-------|-------|-----------|-----------|
|      | Females | Males | Jacks |           |           |
| 1988 |         |       |       |           |           |
| 1989 |         |       |       |           |           |
| 1990 |         |       |       |           |           |
| 1991 |         |       |       |           |           |
| 1992 |         |       |       |           |           |
| 1993 |         |       |       |           |           |
| 1994 |         |       |       |           |           |
| 1995 | 2,687   | 2,233 |       | 5,376,000 |           |
| 1996 | 2,152   | 1,476 |       | 5,089,000 |           |
| 1997 | 1,847   | 1,936 |       | 3,788,000 |           |
| 1998 | 1,886   | 2,042 |       | 4,923,000 |           |
| 1999 | 1,744   | 1,906 |       | 4,916,000 |           |
| 2000 | 1,762   | 1,825 |       | 4,736,000 |           |
| 2001 | 1,244   | 1,230 |       | 3,051,000 |           |
| 2002 | 1,289   | 1,307 |       | 3,089,000 |           |

### 7.5) Disposition of hatchery-origin fish collected in surplus of broodstock needs.

Upstream escapement goal of 10,000 and the remaining adults are surplus to the food bank.

### 7.6) Fish transportation and holding methods.



NA

**7.7) Describe fish health maintenance and sanitation procedures applied.**

Fish are held for only a short time prior to spawning and require no treatments.

**7.8) Disposition of carcasses.**

Carcasses not taken by the carcass buyer are buried on station.

**7.9) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish resulting from the broodstock collection program.**

NA

**SECTION 8. MATING**

**Describe fish mating procedures that will be used, including those applied to meet performance indicators identified previously.**

**8.1) Selection method.**

Adults are selected throughout the entire run, at random.

**8.2) Males.**

Live spawning and backup males have not been used.

**8.3) Fertilization.**

Fish are spawned in five fish pools and then the gamete pools are mixed. The mixed pools are then combined into a larger container for transportation to the incubation room. All eggs are rinsed and water hardened in iodine for 1 hour.

**8.4) Cryopreserved gametes.**

NA

**8.5) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish resulting from the mating scheme.**

NA

## **SECTION 9. INCUBATION AND REARING -**

**Specify any management *goals* (e.g. “egg to smolt survival”) that the hatchery is currently operating under for the hatchery stock in the appropriate sections below. Provide data on the success of meeting the desired hatchery goals.**

### **9.1) Incubation:**

#### **9.1.1) Number of eggs taken and survival rates to eye-up and/or ponding.**

Green egg to eyed egg loss averages 6%.

#### **9.1.2) Cause for, and disposition of surplus egg takes.**

Extra eggs/fry generally result from unanticipated program changes (co/op or educational programs cancel out). We try to use the extra eggs/fry to meet shortages within the fish health zone or, at last resort, they are planted (unfed fry) into the upper watershed.

Egg takes will be monitored in a manner which minimizes the likelihood of surplus eggs and/or fry.

#### **9.1.3) Loading densities applied during incubation.**

Eggs generally run about 2,100 per pound and they are loaded at 9,000 eggs/tray for eyeing and 8,200 eggs/tray for hatching. Flows are 4 gallons per minute (gpm) for a 8 tray half-stack.

#### **9.1.4) Incubation conditions.**

At Minter Creek the silt loads in the incubators are monitored and the incubators are cleaned as needed. Most of our incubation is done with well water which is a constant 49 degrees Fahrenheit. Some surface water is used when needed if there is not enough well water.

#### **9.1.5) Ponding.**

Fry are usually force ponded in February based on visual inspection of the fish. It is difficult to monitor accurate temperature units to determine when to pond fry as they are sometimes on creek water and sometimes on well water.

**9.1.6) Fish health maintenance and monitoring.**

Fungus is controlled with a formalin drip treatment. Egg mortality is removed using a mechanical picker when eggs reach the eyed stage.

**9.1.7) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish during incubation.**

NA

**9.2) Rearing:**

**9.2.1) Provide survival rate data (*average program performance*) by hatchery life stage (fry to fingerling; fingerling to smolt) for the most recent twelve years (1988-99), or for years dependable data are available..**

Not available

**9.2.2) Density and loading criteria (goals and actual levels).**

Fish are programed not to exceed 3 pounds (lbs)/gpm at release. The 1999 brood group was released at 2.9 lbs/gpm, Flow Index: 1.51 Density Index: 16

**9.2.3) Fish rearing conditions**

Ponds are monitored for temperature, flows and dissolved oxygen levels.

**9.2.4) Indicate biweekly or monthly fish growth information (*average program performance*), including length, weight, and condition factor data collected during rearing, if available.**

Weekly weight samples are taken for feed adjustments CV's is calculated prior to release.

**9.2.5) Indicate monthly fish growth rate and energy reserve data (*average program performance*), if available.**

Not available

**9.2.6) Indicate food type used, daily application schedule, feeding rate range (e.g.**

**% B.W./day and lbs/gpm inflow), and estimates of total food conversion efficiency during rearing (*average program performance*).**

Feed Type: Bio-Diet Starter and Bio-Moist Grower.

Feed Rate: 2.5% B.W./day, not to exceed .10 lbs/gpm inflow

Food Conversion: 1 to1.

**9.2.7) Fish health monitoring, disease treatment, and sanitation procedures.**

Fish health is monitored by staff and a fish health specialist. Treatments are prescribed by the fish health specialist. Ponds are cleaned weekly.

**9.2.8) Smolt development indices (e.g. gill ATPase activity), if applicable.**

NA

**9.2.9) Indicate the use of "natural" rearing methods as applied in the program.**

NA

**9.2.10) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish under propagation.**

NA

**SECTION 10. RELEASE**

**Describe fish release levels, and release practices applied through the hatchery program.**

**10.1) Proposed fish release levels.**

| Age Class  | Maximum Number | Size (fpp) | Release Date | Location     |
|------------|----------------|------------|--------------|--------------|
| Eggs       | ~ 2,187,650*   |            |              |              |
| Unfed Fry  |                |            |              |              |
| Fry        | 2,000,000      | 450        | April        | Minter Creek |
| Fingerling |                |            |              |              |
| Yearling   |                |            |              |              |

\*-2,187,650 eggs are transferred to schools, Co-ops and Regional Enhancement Groups

for releases into various streams in Puget Sound.

**10.2) Specific location(s) of proposed release(s).**

**Stream, river, or watercourse:** Minter Creek (15.0048)  
**Release point:** Minter Creek (RM 0.5)  
**Major watershed:** Minter Creek (15.0048), Carr Inlet  
**Basin or Region:** Puget Sound

**10.3) Actual numbers and sizes of fish released by age class through the program.**

| Release year | Eggs/ Unfed Fry | Avg size | Fry       | Avg size | Fingerling | Avg size | Yearling | Avg size |
|--------------|-----------------|----------|-----------|----------|------------|----------|----------|----------|
| 1988         |                 |          |           |          |            |          |          |          |
| 1989         |                 |          |           |          |            |          |          |          |
| 1990         |                 |          |           |          |            |          |          |          |
| 1991         |                 |          |           |          |            |          |          |          |
| 1992         |                 |          |           |          |            |          |          |          |
| 1993         |                 |          |           |          |            |          |          |          |
| 1994         |                 |          |           |          |            |          |          |          |
| 1995         | 594,000         | 1,200    | 2,045,000 | 500      |            |          |          |          |
| 1996         | 1,092,000       | 1,250    | 2,015,962 | 545      |            |          |          |          |
| 1997         |                 |          | 2,243,500 | 500      |            |          |          |          |
| 1998         |                 |          | 2,066,000 | 590      |            |          |          |          |
| 1999         |                 |          | 2,005,000 | 833      |            |          |          |          |
| 2000         |                 |          | 2,091,000 | 500      |            |          |          |          |
| 2001         |                 |          | 2,368,300 | 481      |            |          |          |          |
| 2002         |                 |          | 794,950   | 701      |            |          |          |          |
| Average      | 843,000         | 1,225    | 1,953,714 | 581      |            |          |          |          |

**10.4) Actual dates of release and description of release protocols.**

Fish have been released between mid-March to mid-May. The release time has varied due to creek flows and dissolved oxygen levels in the ponds. Due to the location of the facility (upper end of the estuary) we try to release at night on an incoming tide to minimize predation.

**10.5) Fish transportation procedures, if applicable.**

NA

**10.6) Acclimation procedures.**

Chum are reared on Minter Creek surface water.

**10.7) Marks applied, and proportions of the total hatchery population marked, to identify hatchery adults.**

None

**10.8) Disposition plans for fish identified at the time of release as surplus to programmed or approved levels.**

None

**10.9) Fish health certification procedures applied pre-release.**

Each lot of fish is examined by a WDFW Fish Health Specialist prior to release or transfer, in accordance with the Co-Managers Salmonid Disease Policy.

**10.10) Emergency release procedures in response to flooding or water system failure.**

In the event of a water system failure, screens would be pulled to allow fish to exit the pond. In some cases they can be transferred into other rearing vessels to prevent an emergency release.

**10.11) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish resulting from fish releases.**

The Species Interaction Workgroup (SIWG) (1984) identified chum as posing a low risk of competition and predation to naturally produced chinook in freshwater.

\_\_\_\_\_ Minter Creek hatchery chum likely have little interaction with listed stocks, but may contribute as forage fish to yearling and older chinook (including Hupp Springs White River yearling chinook production), coho, cutthroat and steelhead. They may compete with local natural chum and pink production in the estuarine and marine areas.

## **SECTION 11. MONITORING AND EVALUATION OF PERFORMANCE INDICATORS**

**11.1) Monitoring and evaluation of “Performance Indicators” presented in Section 1.10.**

**11.1.1) Describe plans and methods proposed to collect data necessary to respond to each “Performance Indicator” identified for the program.**

Elements of the annual Monitoring and Evaluation plan for this program are identified in Section 1.10.

**11.1.2) Indicate whether funding, staffing, and other support logistics are available or committed to allow implementation of the monitoring and evaluation program.**

**11.2) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish resulting from monitoring and evaluation activities.**

## **SECTION 12. RESEARCH**

**12.1) Objective or purpose.**

**12.2) Cooperating and funding agencies.**

**12.3) Principle investigator or project supervisor and staff.**

**12.4) Status of stock, particularly the group affected by project, if different than the stock(s) described in Section 2.**

**12.5) Techniques: include capture methods, drugs, samples collected, tags applied.**

**12.6) Dates or time period in which research activity occurs.**

**12.7) Care and maintenance of live fish or eggs, holding duration, transport methods.**

**12.8) Expected type and effects of take and potential for injury or mortality.**

**12.9) Level of take of listed fish: number or range of fish handled, injured, or killed by sex, age, or size, if not already indicated in Section 2 and the attached “take table” (Table 1).**

**12.10) Alternative methods to achieve project objectives.**

**12.11) List species similar or related to the threatened species; provide number and causes of mortality related to this research project.**

**12.12) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse ecological effects, injury, or mortality to listed fish as a result of the proposed research activities.**

## **SECTION 13. ATTACHMENTS AND CITATIONS**

Hershberger, W.K., and R.N. Iwamoto. 1981. Genetics Manual and Guidelines for the Pacific Salmon Hatcheries of Washington. Univ. of Wash. College of Fisheries. Seattle, Wa. 83 pp.

Seidel, Paul. 1983. Spawning Guidelines for Washington Department of Fish and Wildlife Hatcheries. Washington Department of Fish and Wildlife. Olympia, Wa.

SIWG (Species Interaction Work Group). 1984. Evaluation of potential species interaction effects in the planning and selection of salmonid enhancement projects. J. Rensel, chairman and K. Fresh, editor. Report prepared for the Enhancement Planning Team for implementation of the Salmon and Steelhead Conservation and Enhancement Act of 1980. Washington Department of Fisheries. Olympia, WA. 80pp

U.S. District Court of Western Washington. 1976. United States v. Washington, 384 F, Supp. 312.

United States v. Washington, No. 9213 Phase 1 (sub no. 85-2) Order Adopting Puget Sound Management Plan, 1985.

Washington Department of Fisheries. 1991. Stock Transfer Guidelines. Hatcheries Program, Washington Department of Fisheries. Olympia, Wa.

Washington Department of Fish and Wildlife and Western Washington Treaty Indian Tribes. 1998. Salmonid Disease Control Policy of the Fisheries Co-Managers of Washington State. Washington Department of Fish and Wildlife. Olympia, Wa.



#### **SECTION 14. CERTIFICATION LANGUAGE AND SIGNATURE OF RESPONSIBLE PARTY**

“I hereby certify that the foregoing information is complete, true and correct to the best of my knowledge and belief. I understand that the information provided in this HGMP is submitted for the purpose of receiving limits from take prohibitions specified under the Endangered Species Act of 1973 (16 U.S.C.1531-1543) and regulations promulgated thereafter for the proposed hatchery program, and that any false statement may subject me to the criminal penalties of 18 U.S.C. 1001, or penalties provided under the Endangered Species Act of 1973.”

Name, Title, and Signature of Applicant:

Certified by \_\_\_\_\_ Date: \_\_\_\_\_

Table 1. Estimated listed salmonid take levels of by hatchery activity.

| <b>Listed species affected: Chinook ESU/Population: Puget Sound Activity: Hatchery Operations</b>                   |   |                |         |         |
|---|---|----------------|---------|---------|
| <b>Location of hatchery activity: Minter Creek Dates of activity: October-April Hatchery program operator: WDFW</b> |   |                |         |         |
| <b>Type of Take</b>   | <b>Annual Take of Listed Fish By Life Stage (<i>Number of Fish</i>)</b> |                |         |         |
|   | Egg/Fry   | Juvenile/Smolt | Adult   | Carcass |
| <b>Observe or harass a)</b>   |   |                |         |         |
| <b>Collect for transport b)</b>   |   |                |         |         |
| <b>Capture, handle, and release c)</b>  |   |                | Unknown |         |
| <b>Capture, handle, tag/mark/tissue sample, and release d)</b>  |   |                |         |         |
| <b>Removal (e.g. broodstock) e)</b>   |   |                |         |         |
| <b>Intentional lethal take f)</b>   |   |                |         |         |
| <b>Unintentional lethal take g)</b>   |   |                | Unknown |         |
| <b>Other Take (specify) h)</b>  |   |                |         |         |

- a. Contact with listed fish through stream surveys, carcass and mark recovery projects, or migrational delay at weirs.
- b. Take associated with weir or trapping operations where listed fish are captured and transported for release.
- c. Take associated with weir or trapping operations where listed fish are captured, handled and released upstream or downstream.
- d. Take occurring due to tagging and/or bio-sampling of fish collected through trapping operations prior to upstream or downstream release, or through carcass recovery programs.
- e. Listed fish removed from the wild and collected for use as broodstock.
- f. Intentional mortality of listed fish, usually as a result of spawning as broodstock.
- g. Unintentional mortality of listed fish, including loss of fish during transport or holding prior to spawning or prior to release into the wild, or, for integrated programs, mortalities during incubation and rearing.
- h. Other takes not identified above as a category.

**Instructions:**

1. An entry for a fish to be taken should be in the take category that describes the greatest impact.
2. Each take to be entered in the table should be in one take category only (there should not be more than one entry for the same sampling event).
3. If an individual fish is to be taken more than once on separate occasions, each take must be entered in the take table.